

REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
D	Delete vendors, CAGE 18324, CAGE 34335, and CAGE 07263. Change in terminal connections and truth table. Add logic diagram. Revise to military drawing format. Change code ident. no..	87-08-31	N. A. Hauck
E	Update to reflect latest changes in format and requirements. Editorial changes throughout. --les	04-05-13	Raymond Monnin

THE ORIGINAL FIRST PAGE OF THIS DRAWING HAS BEEN REPLACED.

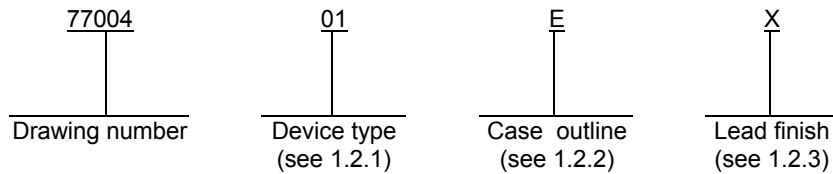
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				D. A. DiCenzo																															
				APPROVED BY				MICROCIRCUIT, DIGITAL, BIPOLAR SCHOTTKY TTL, DECODER, MONOLITHIC SILICON																											
				N. A. Hauck																															
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1. SCOPE

1.1 Scope. This drawing describes device requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A.

1.2 Part or Identifying Number (PIN). The complete PIN is as shown in the following example:



1.2.1 Device type(s). The device type(s) identify the circuit function as follows:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	54S139	Dual 2 to 4 line decoder/demultiplexer

1.2.2 Case outline(s). The case outline(s) are as designated in MIL-STD-1835 and as follows:

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
E	GDIP1-T16 or CDIP2-T16	16	dual-in-line
F	GDFP2-F16 or CDFP3-F16	16	flat

1.2.3 Lead finish. The lead finish is as specified in MIL-PRF-38535, appendix A.

1.3 Absolute maximum ratings.

Supply voltage	-0.5 V dc to +7.0 V dc
Input voltage range.....	-1.2 V dc at -18 mA to +5.5 V dc
Storage temperature range.....	-65°C to +150°C
Maximum power dissipation (P_D) ^{1/}	495 mW
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case (θ_{JC}):	See MIL-STD-1835
Junction temperature (T_J)	+175°C

1.4 Recommended operating conditions.

Supply voltage range (V_{CC})	4.5 V dc minimum to 5.5 V dc maximum
Minimum high level input voltage (V_{IH})	2.0 V dc
Maximum low level input voltage (V_{IL})	0.8 V dc
Case operating temperature range (T_C)	-55°C to +125°C

^{1/} Maximum power dissipation is defined as $V_{CC} \times I_{CC}$, and must withstand the added P_D due to short-circuit test; e.g., I_{OS} .

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2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbooks. The following specification, standards, and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-38535 -- Integrated Circuits, Manufacturing, General Specification for.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-883 - Test Method Standard Microcircuits.
MIL-STD-1835 - Interface Standard Electronic Component Case Outlines.

HANDBOOKS

DEPARTMENT OF DEFENSE

MIL-HDBK-103 -- List of Standard Microcircuit Drawings.
MIL-HDBK-780 - Standard Microcircuit Drawings.

(Unless otherwise indicated, copies of the specification, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein. Product built to this drawing that is produced by a Qualified Manufacturer Listing (QML) certified and qualified manufacturer or a manufacturer who has been granted transitional certification to MIL-PRF-38535 may be processed as QML product in accordance with the manufacturers approved program plan and qualifying activity approval in accordance with MIL-PRF-38535. This QML flow as documented in the Quality Management (QM) plan may make modifications to the requirements herein. These modifications shall not affect form, fit, or function of the device. These modifications shall not affect the PIN as described herein. A "Q" or "QML" certification mark in accordance with MIL-PRF-38535 is required to identify when the QML flow option is used.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535, appendix A and herein.

3.2.1 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.3 Truth table. The truth table shall be as specified on figure 2.

3.2.4 Logic diagram. The logic diagram shall be as specified on figure 3.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and shall apply over the full case operating temperature range.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C <u>1/</u> unless otherwise specified		Group A subgroups	Device type	Limits		Unit		
						Min	Max			
High level output voltage	V _{OH}	V _{CC} = 4.5 V, I _{OH} = -1.0 mA, V _{IH} = 2.0 V, V _{IL} = 0.8 V		1, 2, 3	All	2.5		V		
Low level output voltage	V _{OL}	V _{CC} = 4.5 V, I _{OL} = 20 mA, V _{IH} = 2.0 V, V _{IL} = 0.8 V		1, 2, 3	All		0.5	V		
Input clamp voltage	V _{IC}	V _{CC} = 4.5 V, I _{IN} = -18 mA		1, 2, 3	All		-1.5	V		
High level input current	I _{IH1}	V _{CC} = 5.5 V, V _{IH} = 2.7 V		1, 2, 3	All		50	μA		
	I _{IH2}	V _{CC} = 5.5 V, V _{IH} = 5.5 V		1, 2, 3	All		1.0	mA		
Low level input current	I _{IL}	V _{CC} = 5.5 V, V _{IL} = 0.5 V		1, 2, 3	All		-2.0	mA		
Short circuit output current	I _{OS}	V _{CC} = 5.5 V, V _{out} = 0.0 V <u>1/</u>		1, 2, 3	All	-40	-100	mA		
Supply current	I _{CC}	V _{CC} = 5.5 V		1, 2, 3	All		90	mA		
Functional tests		See 4.3.1c		7	All					
Propagation delay time, output from binary select to any 2 levels of delay	t _{PHL1}	V _{CC} = 5.0 V, R _L = 280Ω ±5% <u>2/</u>	C _L = 15 pF ±10%	9	All		10	ns		
				10, 11	All		14	ns		
			C _L = 50 pF ±10%	9	All		19	ns		
				10, 11	All		27	ns		
	t _{PLH1}		C _L = 15 pF ±10%	9	All		8	ns		
				10, 11	All		11	ns		
			C _L = 50 pF ±10%	9	All		13	ns		
				10, 11	All		18	ns		
			Propagation delay time, output from binary select to any 3 levels of delay	t _{PHL2}	C _L = 15 pF ±10%	9	All		12	ns
						10, 11	All		17	ns
C _L = 50 pF ±10%	9	All				17	ns			
	10, 11	All				24	ns			
t _{PLH2}	C _L = 15 pF ±10%	9		All		12	ns			
		10, 11		All		17	ns			
	C _L = 50 pF ±10%	9		All		17	ns			
		10, 11		All		24	ns			
Propagation delay time, output from enable to any 2 levels of delay	t _{PHL3}	V _{CC} = 5.0 V, R _L = 280Ω ±5% <u>2/</u>	C _L = 15 pF ±10%	9	All		10	ns		
				10, 11	All		14	ns		
			C _L = 50 pF ±10%	9	All		15	ns		
				10, 11	All		21	ns		
	t _{PLH3}		C _L = 15 pF ±10%	9	All		8	ns		
				10, 11	All		11	ns		
			C _L = 50 pF ±10%	9	All		13	ns		
				10, 11	All		18	ns		

1/ Not more than one output should be shorted at a time and the duration of the short circuit condition should not exceed one second.

2/ Propagation delay time testing and maximum clock frequency testing may be performed using either C_L = 15 pF or C_L = 50 pF. However, the manufacturer must certify and guarantee that the microcircuits meet the switching test limits specified for a 50 pF load.

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3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table I.

3.5 Marking. Marking shall be in accordance with MIL-PRF-38535, appendix A. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in MIL-HDBK-103 (see 6.6 herein).

3.5.1 Certification/compliance mark. A compliance indicator "C" shall be marked on all non-JAN devices built in compliance to MIL-PRF-38535, appendix A. The compliance indicator "C" shall be replaced with a "Q" or "QML" certification mark in accordance with MIL-PRF-38535 to identify when the QML flow option is used.

3.6 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-HDBK-103 (see 6.6 herein). The certificate of compliance submitted to DSCC-VA prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-PRF-38535, appendix A and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DSCC-VA shall be required in accordance with MIL-PRF-38535, appendix A.

3.9 Verification and review. DSCC, DSCC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

Device types	01
Case outlines	E, F
Terminal number	Terminal symbols
1	1 \bar{G}
2	1A
3	1B
4	1Y0
5	1Y1
6	1Y2
7	1Y3
8	GND
9	2Y3
10	2Y2
11	2Y1
12	2Y0
13	2B
14	2A
15	2 \bar{G}
16	V _{CC}

FIGURE 1. Terminal connections.

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Inputs			Outputs			
Enable \overline{G}	Select		Y0	Y1	Y2	Y3
	B	A				
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

H = High voltage level
L = Low voltage level
X = Irrelevant

FIGURE 2. Truth table.

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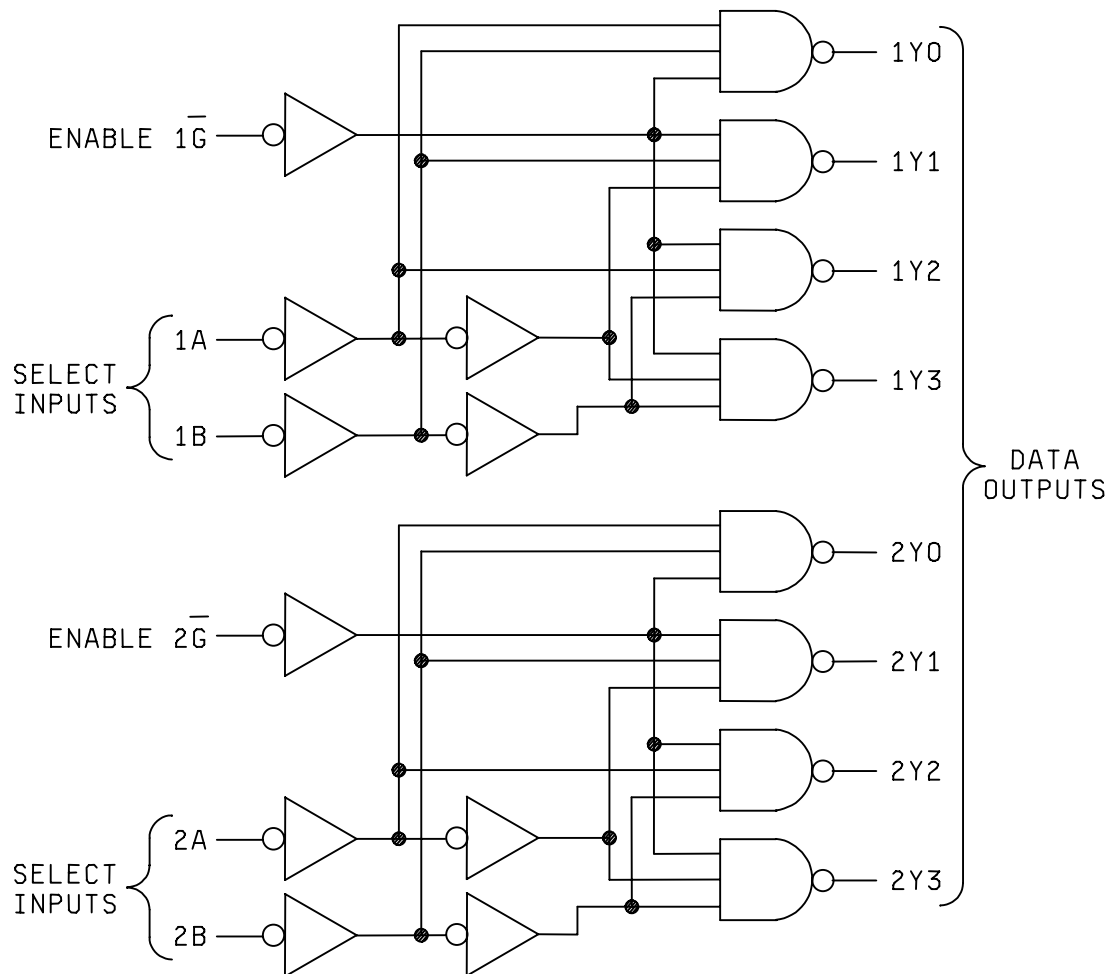


FIGURE 3. Logic diagram.

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4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

(2) $T_A = +125^{\circ}\text{C}$, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (in accordance with MIL-STD-883, method 5005, table I)
Interim electrical parameters (method 5004)	- - -
Final electrical test parameters (method 5004)	1*, 2, 3, 9
Group A test requirements (method 5005)	1, 2, 3, 7, 9, 10**, 11**
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3

* PDA applies to subgroup 1.

** Subgroups 10 and 11, if not tested, shall be guaranteed to the specified limits in table I.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. Subgroups 4, 5, 6 and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroup 7 shall include verification of the truth table.

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4.3.2 Groups C and D inspections.

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test conditions, method 1005 of MIL-STD-883.
 - (1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.
 - (2) $T_A = +125^{\circ}\text{C}$, minimum.
 - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38535, appendix A.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished using DD Form 1692, Engineering Change Proposal.

6.4 Record of users. Military and industrial users shall inform Defense Supply Center Columbus when a system application requires configuration control and the applicable SMD. DSCC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-0544.

6.5 Comments. Comments on this drawing should be directed to DSCC-VA, Columbus, Ohio 43216-5000, or telephone (614) 692-0547.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-HDBK-103. The vendors listed in MIL-HDBK-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DSCC-VA.

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STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 04-05-13

Approved sources of supply for SMD 77004 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38535 during the next revision. MIL-HDBK-103 and QML-38535 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DSCC-VA. This bulletin is superseded by the next dated revision of MIL-HDBK-103 and QML-38535.

Standard microcircuit drawing PIN <u>1/</u>	Vendor CAGE number	Vendor similar PIN <u>2/</u>	Reference military specification PIN
7700401EA	01295 ODSK7	SNJ54S139J GEM08501QEA	M38510/07702BEA
7701001EC	0DKS7	GEM08501QEC	
7701001FA	01295 ODSK7	SN54S1396W GEM08501QFA	M38510/07702BFA
7701001FC	0DKS7	GEM08501QFC	

1/ The lead finish shown for each PIN representing a hermetic package is the most readily available from the manufacturer listed for that part. If the desired lead finish is not listed contact the vendor to determine its availability.

2/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

Vendor CAGE
number

01295

Vendor name
and address

Texas Instruments, Inc.
Semiconductor Group
8505 Forest Ln.
PO Box 660199
Dallas, Tx 75243
POC U.S. Highway 75 South
P.O. Box 84, M/S 853
Sherman, TX 75090-9493

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